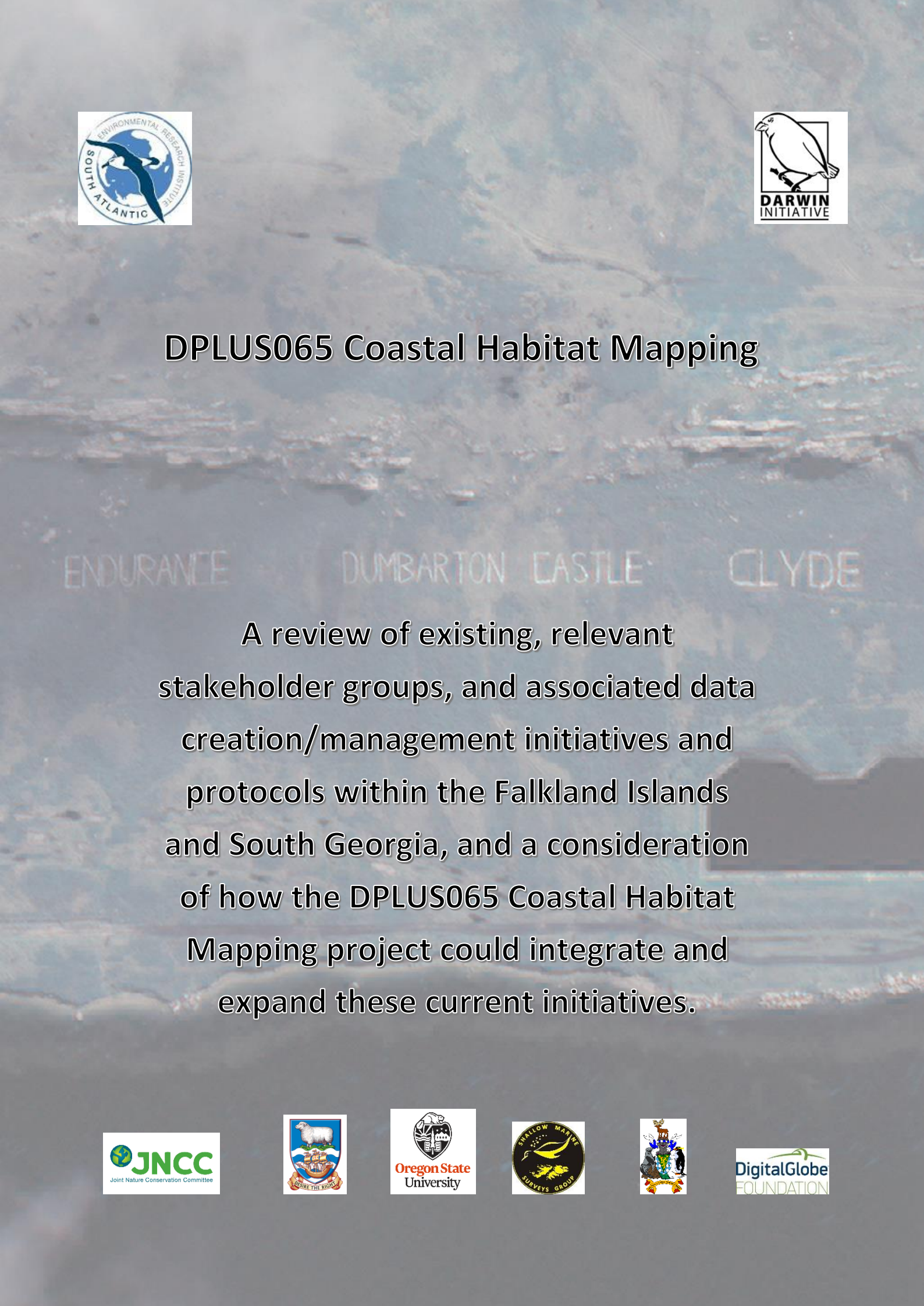

DPLUS065 Coastal Habitat Mapping

A review of existing, relevant stakeholder groups, and associated data creation/management initiatives and protocols within the Falkland Islands and South Georgia, and a consideration of how the DPLUS065 Coastal Habitat Mapping project could integrate and expand these current initiatives.

Version Control Table

Version	Date	Author	Comments
0.1	07/03/19	NG	First draft circulated to PMG
0.2	08/03/19	NG	Final draft incorporating comments from GSGSSI & IMS Data Centre

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Cover image: Satellite imagery courtesy of Digital Globe Foundation*. Pan-Sharpened image of the Camber, Stanley Harbour, East Falkland by Brandi Black.*

1. Introduction

A wide range of scientific research is undertaken within the Falklands and South Georgia, generating significant amounts of data. This short report summarises the existing stakeholder groups within the Falkland Islands and South Georgia of relevance to the DPLSU065 Coastal Habitat Mapping project and discusses the various data initiatives underway. Specifically, it then discusses how the Coastal Habitat Mapping project will contribute and expand these current initiatives.

2. Existing relevant stakeholder groups within Falkland Islands and South Georgia

2.1. Falkland Islands

Falkland Islands Fishing Companies Association (FIFCA)
Falkland Island Petroleum Producers Association (FIPLA)
Environment Committee
Fisheries Committee
Lands Committee
Rural Business Association (RBA)
Falkland Island Tourism Association
Falkland Island Tourism Board
Falkland Islands Yacht Club

2.2. South Georgia

British Antarctic Survey (BAS)
International Association of Antarctica Tour Operators (IAATO)
South Georgia Heritage Trust
Royal Botanic Gardens, Kew
Geometria http://www.geometria.co.nz/
Indigena Biosecurity International http://www.indigena.co.nz/
South Georgia Association
South Georgia Surveys (Sally Poncet)

3. Data management initiatives in the Falkland Islands

The Falkland Islands now has a well-established environmental data management framework. The Foreign & Commonwealth Office initially funded the South Atlantic IMS-GIS (Information Management System and Geographic Information System) data centre in 2013 for a two-year period and this was managed by the South Atlantic Environmental Research Institute (SAERI). This funding allowed for the recruitment of two data managers, based in the Falkland Islands and St Helena respectively.

The vision of the IMS-GIS data centre is to develop and implement tools and services for a sustainable and integrated data/information management system, including data documentation, discovery, access, visualisation and analysis. Since its inception, the IMS-GIS data centre has

demonstrated that stakeholder engagement is fundamental to the realisation and establishment of a central, standardised system for data management, accessibility and sharing in the region.

Integral to the IMS-GIS data centre realising its vision is an ISO19115 compliant metadata catalogue, as well as data dissemination mechanisms using simple webGIS services. This allows the wider public to search for data that has been collected from the Falkland Islands, and make a request to access this data. WebGIS is essentially a simplified GIS system that uses web technologies to make data accessible to the public regardless of whether or not they have a background and knowledge about GIS.

A key tool implemented by the IMS-GIS data centre is the use of Research Licence Agreements. Anyone undertaking environmental research within the Falklands is required to submit a Research Licence application to the Falkland Islands Government. This ensures that all scientific research is passed through the Environment Committee. It also provides guidance on submitting data & metadata to the IMS-GIS data centre upon completion of the research. Alongside the Research Licence Agreement, there is an accompanying Falkland Islands data policy and environmental data recommendations. If the research involves invasive techniques such as sampling of animal tissues or handling live animals, then an Invasive Research Techniques Application form should be submitted. This is to supplement the information obtained through the research licence applications and helps the Environment Committee make decisions on Invasive Research Techniques.

The FIG Fisheries Department collect and manage their own fisheries and bycatch data, and have developed data management protocols in-house for their work.

4. Data management initiatives in South Georgia

Relatively speaking, data management initiatives within South Georgia are more fragmented than within the Falklands, with no centralised database storage for the bulk of environmental research data.

The Government of South Georgia & the South Sandwich Islands (GSGSSI) manages a significant proportion of environmental and scientific research undertaken on South Georgia through a Regulated Activity Permit (RAP) system, although it should be noted that there is currently no requirement for researchers to submit metadata to GSGSSI (or other parties) when collecting data from South Georgia, such as that required in the Falkland Islands.

The majority of spatial data gathered from South Georgia is disseminated to the wider public via the South Georgia Geographical Information System. This system is managed by the British Antarctic Survey Mapping and Geographic Information Centre (MaGIC); the South Georgia Geographic Information System (SGGIS) enables researchers and the public to access spatially explicit information about the islands' environmental landscape. The Government of South Georgia & the South Sandwich Islands commissioned GIS developers at British Antarctic Survey (BAS) to create the SGGIS. It combines a detailed interactive map of South Georgia with a variety of information such as the topography, vegetation and glacier change to historic sites, protected areas and distributions of various animals, such as seals and penguins. It was updated comprehensively in 2016-17 and now includes high resolution mapping data for key areas. In addition, the British Antarctic Survey also

manage a proportion of GSGSSI's fisheries and higher predator monitoring including associated data management procedures. A specific Darwin Initiative project led by BAS (DPLU069) is building data resources for managing the SGSSI MPA.

The Centre for Environment, Fisheries and Aquaculture Science (Cefas) provide scientific advice to GSGSSI, specifically with respect to fisheries and marine protected areas. Cefas store and manage data in relation to these areas.

GSGSSI has a non-native invasive plant strategy, and has worked with Indigena Biosecurity International, South Georgia Surveys, and the Royal Botanic Gardens, Kew (including through Darwin Initiative projects DPLU015 and DPLUS080) to develop a weed database and associated data management initiatives.

Some visiting cruise ships have undertaken vegetation BioBlitz surveys on South Georgia. With notifications of new sightings of invasive plant species being reported to GSGSSI and its partners as a result.

Geometria have collected drone and laser imagery of South Georgia's heritage (whaling stations). These data are currently held by Geometria. Drone imagery has been shared with the DPLUS065 project and processed, in order for it to be fed into the fine-scale habitat modelling workflow for GSGSSI.

5. Next steps - how will the DPLUS065 Coastal Habitat Mapping project integrate and expand these current initiatives?

The DPLUS065 Coastal Habitat Mapping has been proactive in utilising current data management/sharing initiatives, as well as developing new systems.

DPLUS065 has fed into the South Georgia Geographical Information System; its broad-scale maps are now available online through the SG GIS. The DPLUS065 project has also processed the Geometria drone imagery to feed into the project.

SAERI has also developed a bespoke webGIS for the Falklands part of DPLUS065. This will be the mechanism by which the wider public access the wide variety of spatial outputs the project is producing for the Falklands.

Within the Falklands, the synergies between the DPLUS065 Coastal Habitat Mapping and DPLUS083 Soil Mapping projects are clear, and there would be benefit in the future exploring synergies for how the outputs from these projects could be combined to answer wider questions about the Falklands terrestrial habitats.

DPLUS065 has contributed to the DPLUS069 project, "Building data resources for managing the SGSSI Marine Protected Area", including giving a presentation on the Coastal Mapping Project at a *Workshop on Developing a Research and Monitoring Plan for the South Georgia and South Sandwich Islands Marine Protected Area* in December 2018. Coastal imagery collected by DPLU065 may be relevant for MPA management data needs, e.g. seasonal variation in ocean opacity, and mapping kelp beds – important for juvenile fish and seal pups, and seasonally very dynamic.

DPLUS065 has looked at developing technologies with respect to smartphone apps. SAERI has developed a bespoke recording form for the project, based on the Open Data Kit smartphone application, which significant improves the efficiency and accuracy of the ground validation phase of the project. Other partners within the project are using smartphone apps in their work. For example, GSGSSI and Indigena are using a smartphone app called iNatural, which is used for field recording. In addition, another GSGSSI stakeholder, SGHT, are looking to develop an app to be used by citizen scientists when visiting sites on South Georgia – rather like a "Wiki" for landing sites. Finally, discussions are ongoing between SAERI and GSGSSI regarding the potential for developing other smartphone apps that could be used on South Georgia for visitors, or citizen scientist, to contribute to the island stewardship whilst visiting, and to record heritage items.

Future work in South Georgia could link in with the current invasive species work, to integrate invasive plant sightings and also identify areas that might be vulnerable to invasive species and thus aid in providing sites that might be targets for fieldwork in future.

With a raft of old imagery available from the 90's, such as the fur seal census flown by helicopter, this imagery would provide a crucial visual record from which comparisons with the new mapping outputs coming our of DPLUS065 could be made. This imagery is currently held by the British Antarctic Survey.

The outputs of DPLUS065 will provide a baseline data for monitoring the changes in vegetation following reindeer and rodent eradication, and from increasing tourist numbers. Future work will be required to detect this change, and the direction of change.

Finally, the DPLUS065 project contributes baseline data for the MPA issues mentioned above (kelp coverage, opacity) for which there is very little, if any data currently available, and there would be plenty of scope to take this work forward into the future from a marine monitoring perspective.